UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/938,394	08/23/2001	Duane Fasen	10004405-1	2455

7590 12/04/2002

AGILENT TECHNOLOGIES, INC.
Legal Department, DL429
Intellectual Property Administraion
P.O. Box 7599
Loveland, CO 80537-0599

EXAMINER
MANDALA, VICTOR A

ART UNIT	PAPER NUMBER
2826	

DATE MAILED: 12/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/938,394	FASEN ET AL.
	Examiner	Art Unit
	Victor A Mandala Jr.	2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 September 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 August 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Applicant's Arguments

1. The Applicant argues that the planarization layer 18 of Daly et al. U.S. Patent No. 5,654,202 is not a bottom antireflection layer. The Applicant defines the bottom reflection layer in Amendment B as a layer that may suppress unwanted resist-activating radiation by absorption or wave cancellation, or both. Daly defines the planarization layer 18 as a layer that is photo-responsive, (Col. 9 Lines 12-13), and transparent at wavelengths of light at which the device operates, (Col. 3 Lines 52-55). The examiner finds the Applicant's definition of the bottom antireflection layer to be the same as Daly et al.'s planarization layer 18 because the Applicant explains the layer to absorb radiation, which is found to mean the same as transparent to wavelengths of light, (Daly et al.) which a transparent layer allows the passage of a specified form of radiation. The examiner finds the applicant's arguments to be non-persuasive and Daly et al. 35 U.S.C 102b rejection, (claims 13, 15, and 17-19), is made final.

2. The Applicant argues that the passivation layer of Yang et al. U.S. Patent No. 6,148,055 is not a bottom antireflection layer. The Applicant argues that a passivation layer that is transparent to light within operating wavelength range is not suggested to be an antireflection layer. The Applicant defines the bottom reflection layer in Amendment B as a layer that may suppress unwanted resist-activating radiation by absorption or wave cancellation, or both. The Applicant explains that the antireflection layer absorbs radiation, which a transparent layer allows the passage of a specified form of radiation. The examiner finds the Applicant's definition of the bottom antireflection layer to be the same as Yang et al.'s passivation layer.

The examiner finds the applicant's arguments to be non-persuasive and Yang et al. 35 U.S.C 102e rejection, (claims 13 and 20), is made final.

3. The Applicant argues that the combination of Daly et al. U.S. Patent No. 5,654,202 in view of Dixit et al. U.S. Patent No. 6,106,995 is impermissible. The Applicant does not give valid arguments that tend to the wording of the claimed matter in claim14. The examiner finds the Applicant's arguments to be non-persuasive because Daly et al. uses an antireflection layer in a semiconductor and Dixit et al. teaches an organic antireflection layer, (Col. 2 Lines 9-11), that is used in semiconductors, (Col. 1 Lines 9-12). One skilled in the art would find it obvious to combine the teachings of Daly et al. with Dixit et al. because Daly et al. and Dixit et al. antireflection layers performs the same as the Applicants. Daly et al. discloses the claimed invention except for an organic antireflection layer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an organic antireflection layer as taught in Dixit et al., since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416. The examiner finds the applicant's arguments to be non-persuasive and Daly et al. in view of Dixit et al. 35 U.S.C 103a rejection, (claim 14), is made final.

4. The Applicant argues that Murakami et al. fails to teach or suggest that selecting the thickness of an antireflection layer based on considerations of an optical transmission characteristic of one or more colors of a filter array. Murakami et al. teaches that adjusting the thickness of the antireflection layer will set a relatively flat spectral characteristics in a visible light region. Murakami et al. is teaching that by adjusting the thickness of the antireflection

layer will adjust the amount different colors will be absorbed. The examiner finds the Applicant's teachings of adjusting the thickness of the antireflection layer to be the same as Murakami et al. The examiner finds the applicant's arguments to be non-persuasive and a Daly et al. in view of Murakami et al. 35 U.S.C 103a rejection, (claim 16), is made final.

Drawings

5. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the antireflection layer being present only in regions under the color filter array material must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. Figure 1 is a cropped view and does not show where the antireflection layer ends.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 13, 15, and17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,654,202 Daly et al.

6. Referring to claim 13, an image sensor system, (Col. 1 Lines 7-10), comprising: an active image sensing device structure, (Figure 2 #13, #14, & #15); a color filter array, (Figure 2 #19); and a bottom antireflection coating, (Figure 2 #18), disposed between the color filter array, (Figure 2 #19), and a surface of the active image sensing device structure, (Figure 2 #13, #14, & #15).

7. Referring to claim 15, wherein the bottom antireflection coating, (Figure 2 #18), comprises a light absorbing polymeric film forming material, (Col. 9 Lines 12-13 & Col. 11 Lines 17-22).

8. Referring to claim 17, wherein the bottom antireflection coating, (Figure 2 #18), is substantially transmissive to radiation in a wavelength range of about 400nm to about 700nm, (Col. 9 Lines 12-13 & Col. 11 Lines 17-22).

9. Referring to claim 18, wherein the color filter array, (Figure 2 #19), comprises a plurality of colored photoresist structures, (Col. 1 Lines 41-51).

10. Referring to claim 19, wherein the bottom antireflection coating, (Figure 2 #18), has a substantially higher plasma etch rate, (** See below), than the color filter array, (Figure 2 #19).

**It is apparent in Daly et als' design that the same material for the antireflection coating is used in the applicants' design, thus the material would have the same physical properties resulting in the same output as claimed in claim 19.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 13 & 20 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,184,055 Yang et al.

11. Referring to claim 13, an image sensor system, (Col. 1 Lines 8-11), comprising: an active image sensing device structure, (Figure 7j, (self labeled by numbers), #3); a color filter array, (Figure 7j, (self labeled by numbers), #1); and a bottom antireflection coating, (Figure 7j, (self labeled by numbers), #2 & see also *** below), disposed between the color filter array, (Figure 7j, (self labeled by numbers), #1), and a surface of the active image sensing device structure, (Figure 7j, (self labeled by numbers), #3).

*** It is apparent in Yang et als' design that the passivation layer is a antireflection coating because in Col. 10 Lines 22 & 29-31 explains that metal layers M1 and M2 are used to shield non-photosensing regions and additional layers maybe added to due that but it does not state that the passivation layer performs this task. It is apparent that the passivation layer allows light to transmit through, thus being an antireflection coating.

12. Referring to claim 20, wherein the active image sensor device structure comprises a complementary metal-oxide-semiconductor (CMOS) image sensor, (Col. 1 Lines 8-11).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,654,202 Daly et al in view of U.S. Patent No. 6,060,732 Murakami et al.

13. Referring to claim16, wherein the bottom antireflection coating, (Daly et als' Figure 2 #18 & Murakami et als' Figure 7 #15), has a thickness selected to improve an optical transmission characteristic of one or more colors of the color filter array, (Col. 2 Lines 7-11).

It would be obvious to one skilled in the art to combine the teachings of Daly et al. and combine them with the teachings of Murakami because adjusting the thickness of an

antireflective film would allow adjustment to the focal point and to the refractory angle, thus allowing the sensor to be adjusted to properly sense. These teachings are well known in the art and by people who wear classes.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,654,202 Daly et al in view of U.S. Patent No. 6,106,995 Dixit et al.

14. Referring to claim 14, wherein the bottom antireflection coating comprises a dyed organic film-forming material, (Dixit et al.Col. 2 Lines 9-11 and Col.2 Lines 15&16).

It would be obvious to combine the teachings of Daly et al. and the teachings of Dixit et al. because the dyed organic antireflection film reduces the reflectivity from the substrate allowing proper sensing from the sensor. Daly et al. discloses the claimed invention except for an organic antireflection layer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an organic antireflection layer as taught in Dixit et al., since it has been held to be within the general skill of a worker in the art to select a known

material on the basis of its suitability for the intended use as a matter of obvious design choice.

In re Leshin, 125 USPQ 416.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,654,202 Daly et al.

15. Referring to claim 21, wherein the bottom antireflection coating has a thickness less than approximately 200 nm.

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

16. Referring to claim 22, wherein the bottom antireflection coating has a thickness of anout 60 nm.

Note that the specification contains no disclosure of either the critical nature of the claimed dimensions or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

17. Referring to claim 23, wherein the bottom antireflection coating is present only in regions under color filter array material, (Col. 11 Lines 10-22).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor A Mandala Jr. whose telephone number is (703) 308-6560. The examiner can normally be reached on Monday through Thursday from 8am till 6pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (703) 308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

NATHAN J. FLYNN
PATENT EXAMINER
TECHNOLOGY CENTER 2800

VAMJ
December 2, 2002